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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/681,874	06/20/2001	Donald James Lewis	200-1281(FGT 339)	1549

22844 7590 12/16/2004

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EXAMINER	
NGUYEN, TU MINH	
ART UNIT	**PAPER NUMBER**
3748	

DATE MAILED: 12/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/681,874	LEWIS ET AL.
	Examiner	Art Unit
	Tu M. Nguyen	3748

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *07 September 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5 and 8-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *8-12,19 and 20* is/are allowed.

6)☒ Claim(s) *1,13,15,16 and 18* is/are rejected.

7)☒ Claim(s) *2-5,14 and 17* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 June 2001* is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. An Applicant's Amendment filed on September 7, 2004 has been entered. Claims 6-7 have been canceled; claims 8 and 13 have been amended; and claims 15-20 have been added. Overall, claims 1-5 and 8-20 are pending in this application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 13, 15, 16, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitagawa et al. (U.S. Patent 5,678,402).

Re claims 1, 13, and 16, as illustrated in Figures 1, 2, 14, and 15, Kitagawa et al. disclose an internal combustion engine (1) coupled to an exhaust system having a catalyst (14) and a system and a method of adjusting an oxidant storage capacity of the catalyst, the method comprising:

- estimating a current amount (O2STR) of oxidants stored in the catalyst;
- estimating an amount (O2MAX) of oxidant storage available in the catalyst;
- comparing the estimated amount of oxidants stored in the catalyst to the estimated

amount of oxidant storage available (Processing 7) (as shown in Figure 16A, a current amount O2STR is maintained within a lower limit (O2STRL) and an upper limit (O2STRH));

- adjusting an engine operating parameter (air-fuel ratio) in response to the comparison to secure a maximum purification rate of the catalyst (Processing 8-11).

Kitagawa et al., however, fail to specifically disclose that the engine operating parameter is adjusted to affect a temperature of the catalyst and thereby adjusting an oxidant capacity of the catalyst.

As shown in Figure 15 and indicated on lines 12-40 of column 21, Kitagawa et al. disclose that the purification rate of the catalyst is varied with the catalyst temperature; and that a maximum purification rate is achieved when a decreased amount of oxygen storage amount on a richer side of air-fuel ratio or an increased amount of oxygen storage amount on a leaner side of air-fuel ratio is required to be equal to O2MAX (lines 47-58 of column 24); wherein a correlation of O2MAX as a function of catalyst temperature is shown in Figure 8. In addition, Kitagawa et al. recognize that by modifying the amplitude Kpert and the repetition periods fpertR and ΔtpertR to adjust an engine air-fuel ratio, the catalyst temperature is also changed (see Figures 24A, 26A, and 26C). Thus, it is obvious to those with ordinary skill in the art that Kitagawa et al. adjust an engine operating parameter to affect a temperature of the catalyst and thereby adjusting an oxidant capacity of the catalyst.

Re claims 15 and 18, in the system and method of Kitagawa et al., the controller adjusts an engine air amount in response to the comparison.

Allowable Subject Matter

4. Claims 8-12 and 19-20 are allowed.

Claims 2-5, 14, and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

5. Applicant's arguments with respect to the references applied in the previous Office Action have been fully considered but they are not persuasive.

In response to applicant's argument it is not obvious that Kitagawa et al. adjust an engine air-fuel ratio to affect a temperature of the catalyst (page 8 of Applicant's Amendment), the examiner respectfully disagrees.

As shown in Figures 24A, 26A, and 26C, Kitagawa et al. disclose the correlation of catalyst temperature as a function of the changes made in the amplitude Kpert and the repetition periods fpertR and ΔtpertR. Thus, by adjusting an engine air-fuel ratio to secure a maximum purification rate of the catalyst, Kitagawa et al. also obviously affect a change in temperature of the catalyst.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Communication

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Tu Nguyen whose telephone number is (571) 272-4862.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Thomas E. Denion, can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tu M. Nguyen

TMN

December 13, 2004

Tu M. Nguyen

Patent Examiner

Art Unit 3748